COLLECTION SYSTEM

STANDARD OPERATING PROCEDURES

FOR THE

TOWN OF CHAPEL HILL, TENNESSEE

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
CONSENT ORDER CASE NO. WPC15-0040

JOB NUMBER 2050

DECEMBER 2015

J. R. WAUFORD & COMPANY
CONSULTING ENGINEERS, INC.
2835 LEBANON ROAD
NASHVILLE, TENNESSEE 37214
WWW.JRWAUFORD.COM

Signature

Mark Graves

Printed Name

12-14-15

Date

Signature

Printed Name

Date

Signature

Printed Name

Date

Signature

Printed Name

Date

Signature

Printed Name

Date

COLLECTION SYSTEM STANDARD OPERATING PROCEDURES
CONSENT ORDER CASE NO. WPC15-0040
CHAPEL HILL, TENNESSEE

Description

I. Introduction 1
II. Collection System Personnel 1
A. Summary 1
B. Distinguishing Features of Work 2
C. Examples of Work 2
D. Peripheral Examples of Work 2
III. Lift Station Locations 2
IV. Lift Station Standard Operating Procedures 3
A. Safety 3
B. Daily Checklist 3
C. Annual Checklist 3
D. Removing Pumps From Lift Station 4
E. Installing Pumps Into Lift Station 4
V. Definitions 5
VI. Reporting of Overflow or Non-Compliance 6
A. Twenty Four Hour Reporting 6
B. Five Day Reporting 6
C. Overflow Reporting Forms 6
VII. General Safety 6
A. Purpose 6
B. Personal Protective Equipment 7
C. Additional Protective Guidelines 7
D. Personal Hygiene Practices 8
E. Common Exposures 8
F. Sewage Contamination 8
G. Needles and Syringes 8
H. Risk Management 9

VIII. Collection System Contacts 9

Appendix

Exhibit 1 – Chapel Hill, Tennessee Collection System

****

2050
December 2015

COLLECTION SYSTEM STANDARD OPERATING PROCEDURES (SOP)
CONSENT ORDER CASE NO. WPC15-0040
CHAPEL HILL, TENNESSEE

I. Introduction

The Town of Chapel Hill is located in northeastern Marshall County, Tennessee approximately 45 miles south of Nashville, Tennessee. The City founders located Chapel Hill in the Tennessee Central Basin at approximate elevation 690 feet above mean sea level. The area surrounding Chapel Hill consists of low rolling hills with top elevations of approximately 760 feet above mean sea level. In addition to the surrounding hill tops, Chapel Hill is bordered to the east by Spring Creek which feeds directly into the Duck River and thence to the Tennessee River. Previous research in the area has shown the underlying site to consist of devonian and ordovician, which is susceptible to the typical carbonate hazards of irregular weathering, cave and cavern conditions and overburden sinkholes.

The Town of Chapel Hill operates a Septic Tank Effluent Pump (STEP) collection system, where each individual site contains a small septic tank which receives all of the waste from a dwelling or business. With baffles to separate the solids and liquids, only the liquids are pumped via small diameter pipes into existing gravity mains which flow to one of eight duplex sewage pumping stations (SPS). The gravity mains are located parallel to Nashville Highway / South Horton Parkway with 95 percent eventually flowing to the Morningside Drive SPS. This station and sewage emanating from customers along Highway 31 ultimately discharge to Chapel Hill's 0.17 million gallon per day (MGD) wastewater treatment plant (WWTP). Overall, Chapel Hill's sewage collection system consists of approximately 50,000 linear feet of 2-inch through 12-inch gravity sewers, 28,500 linear feet of force mains, and 7 sewage pumping stations as seen in Exhibit 1.

II. Collection System Personnel

A. Summary

Under general supervision is responsible for learning skilled wastewater collection work, and performs related work as required.

B. Distinguishing Features of Work

An employee in this class performs a variety of work from menial to difficult tasks with emphasis upon learning.

C. Examples of Work

1. Learns to perform maintenance on collection systems as required on buildings, stations, pump houses, and around the treatment plant grassed areas such as mowing, trimming, grounds upkeep, *etc.*

2. Learns to use a variety of tools and equipment such as hand tools, drills, drill presses, pipe cutters, threaders, and voltage meters. Must be able to operate a motor vehicle, tractor, backhoe, and other heavy equipment.

3. Responds promptly to after hour emergency calls including weekends and holidays. Participates in department on-call rotation.

D. Peripheral Examples of Work

Ability to learn to perform skilled wastewater collection work under varying weather conditions, ability to establish and maintain effective working relations with others, and the ability to express oneself clearly and concisely, both orally and in simple writing.

III. Lift Station Locations

- Eagleville Pike
- Stoney Brook
- Maple Street
- Morningside Drive
- Unionville
- Central Avenue
- Henry Horton Park
- Forrest Field

IV. Lift Station Standard Operating Procedures

A. Safety

1. If entry is necessary, make sure there are two people to check stations. Only one person shall enter the station while the other person stands by at the top. All employees shall use safety equipment required for confined space entry.
2. Open lid and let the blower run for five to ten minutes before entering.
3. If the blower is not working, do not enter until you have verified the air conditions using a gas monitor.
4. **Never attempt to rescue a fellow employee who has become unconscious inside of a lift station. First call 911, followed by Supervisor and/or Director. The use of proper confined space safety equipment should include a means of retrieval from the ground surface, such as a safety harness and a tripod.**

B. Daily Checklist

1. Place pumps into "manual" during inspection
2. Check floats and warning lights
3. Check for vibration
4. Verify that check valves are working properly
5. Remove all trash from lift station
6. Write down the times of inspection and maintenance performed (if any) on the data sheet
7. Place pumps into "auto" position before leaving lift station
8. Remove all trash from area around lift station before leaving

C. Annual Checklist

1. Change oil in all lift stations
2. Turn chatterbox off
3. Turn the switch to "off" position on the pump to which you are going to perform service
4. Take the cap off the top of the pump
5. Hook the hoses up to the oil drum
6. Start draining the oil out of the pump and into the bucket

7. After oil has finished pumping, start putting oil back into pump
8. Do not overfill
9. Return cap to the top of the pump
10. Turn the switch to the "on" position and verify that all pumps are in "auto"

D. Removing Pumps From Lift Station

1. Turn the switch and the breaker to "off" position
2. Put a lock and lockout tag on the breaker
3. Put on a hard hat and safety glasses
4. Turn valves to "off" position going to the pump
5. Open the bleed valve to see if it quits draining
6. Take the electric wires loose from pump
7. Loosen the bolts from the pump
8. Leave three bolts in and take the rest out
9. Pull the pump loose making sure the valves are off. Remove the final three bolts if water does not come out
10. If water does come out of pump, tighten the three bolts and check valves
11. Pull the pump to the center of the can

E. Installing Pumps Into Lift Station

1. Put on hard hats and safety glasses
2. Observe safety as per Section V.A. **Never enter a lift station without proper confined space entry safety equipment.**
3. Enter the station if gas monitor reads acceptable
4. Clean the part for the gasket with a wire brush or drill with a wire brush attached to it
5. Exit the lift station and lower the pump into lift station
6. After the pump is safely resting near its final location, re-enter the lift station for final alignment
7. Bolt the pump down and attach all electrical wires to the pump
8. Exit the lift station
9. Open the valve(s) to the pump and make sure there is not a leak
10. Re-enter the lift station and open the bleed valve to get all air out and close it back
11. Exit the lift station

12. Take the lock and lockout tag off the breaker and turn it back to "on" position
13. Place the switch in the "manual" position to test the pump
14. Return the switch to the "auto" position
15. Remove all tools and trash before leaving the lift station

V. Definitions

A **"dry weather overflow"** is a type of sanitary sewer overflow and is defined as one day or any portion of a day in which unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall occurs and is not directly related to a rainfall event. Discharges from more than one point within a 24-hour period shall be considered as separate overflows.

"Overflow" means any release of sewage from any portion of the collection, transmission, or treatment system other than through permitted outfalls.

A **"rainfall event"** is defined as any occurrence of rain, preceded by 10 hours without precipitation that results in an accumulation of 0.01 inches or more. Instances of rainfall occurring within 10 hours of each other will be considered a single rainfall event.

"Reclaimed water" may also be referred to as treated wastewater.

A **"sanitary sewer overflow (SSO)"** is defined as an unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall.

"Wastewater" includes raw sewage, treated sewage and effluent (except disinfected effluent) that may be encountered in any sewerage pipeline or treatment and disposal system (including sewer gravity or rising mains, sewage treatment plant, effluent irrigation system, septic tank waste, sewage sludge, *etc.*), and any other liquid waste or by-products encountered that may be dangerous to human health.

VI. Reporting of Overflow or Non-compliance

A. Twenty Four Hour Reporting

In the case of any non-compliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Pollution Control in the appropriate Environmental Field Office within 24 hours from the time the permittee becomes aware of the circumstances. The Environmental Field Office should be contacted for names and phone numbers of environmental response team.

B. Five Day Reporting

A written submission must be provided within five days of the time the permittee becomes aware of the circumstances unless the director on a case-by-case basis waives this requirement. The permittee shall provide the director with the following information:

1. A description of the discharge and cause of non-compliance;
2. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the non-compliance is expected to continue; and
3. The steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

C. Overflow Reporting Forms

All overflows will be reported on daily log forms and monthly on the Monthly Operating Report (MOR) and Discharge Monitoring Report (DMR). The daily reporting form is located in the Appendix.

VII. General Safety

A. Purpose

When working in a wastewater environment there is potential for exposure to a wide range of illnesses and infections. The purpose of this section is to provide a

procedure, which if followed, will minimize the risk associated with exposure to wastewater. This SOP applies to the Town of Chapel Hill wastewater staff, including contractors, who carry out works involving contact with wastewater. Information may also be applicable to visitors to the Town of Chapel Hill sites and facilities.

B. Personal Protective Equipment

Employees working in a wastewater environment must wear protective clothing and equipment appropriate to the task:

1. Gloves protect the skin and reduce the risk of penetrating injuries
2. Use a face shield if there is a risk of splashes to eyes, nose or mouth
3. Waders or gumboots and overalls reduce skin exposure to wastewater
4. Ensure that any cuts, abrasions, or skin irritations are protected from contact with wastewater either by personal protective equipment or barrier creams

C. Additional Protective Guidelines

1. Lock out the power when performing maintenance on equipment. If a piece of equipment has to be left off for an extended period of time, lock-out/tag-out procedures are to be followed.

2. Always use proper lifting techniques, *i.e.*, "Lift with your legs and keep objects close to your body."

3. When washing the floor of the lift station, post a wet floor sign to warn others. **Do not spray water on the MCC, EMCC or PLC Cabinet.**

4. If you are greasing the bearings on the rotor shafts and you do not feel comfortable doing so while the rotors are in motion, turn them off. Your safety is more important than the Operation and Maintenance.

5. To avoid burns when checking the oil levels in the gearboxes, turn the aerators off and allow about twenty minutes for the oil to cool.

6. All work on major electrical equipment will be done by qualified personnel or contractors.

7. If you feel that a task is too dangerous or you have not been adequately trained to perform a task, you have the right to respectfully refuse doing the task until safety concerns have been resolved or you are comfortable with the amount of training you have received.

D. Personal Hygiene Practices

1. Wash your hands prior to eating, drinking and smoking, and before and after going to the bathroom
2. Keep your lunch room clean and free from contamination
3. Shower at the end of the day
4. Segregate contaminated clothing from clean clothing

E. Common Exposures

Working with wastewater can lead to exposure to infectious agents like bacteria and viruses, which can enter the body via various routes. Common adverse health effects associated with exposure to these agents include Tinea, eye infections, Tetanus, Hepatitis A, Hepatitis B, gastro-enteritis, Dysentery, Giardia, Pneumonia, Influenza, and less likely HIV (through needles and syringes).

F. Sewage Contamination

In the event of sewage contamination, the following procedure should be carried out:

1. Remove contaminated clothing immediately
2. Shower or wash down with copious amounts of water
3. Use eye wash if eyes are contaminated
4. If wastewater is ingested, then advice from a doctor should be sought immediately regarding a preventative dose of immunoglobulin against Hepatitis A, if you are not already immunized
5. Report the incident to your supervisor and complete an Incident/Accident Report form
6. If you develop any symptoms of nausea, vomiting, diarrhea or fever, immediately consult your doctor and inform him/her of your wastewater exposure
7. Carry out a full accident investigation to identify and address contributory factors in order to prevent a recurrence

G. Needles and Syringes

In the event that a needle or syringe is found, the following should be considered:

1. Dispose of any needles or syringes found in the wastewater environment promptly in an appropriate plastic yellow biohazard container
2. Don't place hands in places where needles/syringes could be concealed; use a tool if available and ensure that there is good lighting where working.
3. Consider any blood, body fluids, needles and/or syringes to be infectious.

In the event of a needle stick or "sharps" injury, the following procedure should be carried out:

1. Encourage the wound to bleed slightly, then wash it with soap and warm water
2. Report the injury immediately to your supervisor and complete an Incident/Accident report form. The supervisor is to inform the director without delay.
3. See your doctor immediately as an "antidote" to reduce your risk can be effective if given as soon as possible within twenty four hours of the injury. Relevant blood testing can be conducted if required
4. Previous vaccinations for Hepatitis B, *etc.*, do not necessarily guarantee immunity because immunity can wear off over time and some individuals do not react as expected
5. The supervisor is to arrange for a full accident investigation to identify and address contributory factors in order to prevent a recurrence

H. Risk Management

Adherence to this procedure will minimize the adverse health effects of exposure to wastewater and associated costs of medical expenses/compensation claims.

VIII. Collection System Contacts

Administrator: Mark Graves	(931) 364-7632
John Helmick	(931) 364-7632
Cindy Warner	(931) 364-7632
Nedrow & Associates – Flygt Pumps	(615) 867-7576
G&C Supply	(731) 662-7193

Appendix

Chapel Hill Lift Stations

Monday _____

	OK	NOT OK	NOTES	INITIALS
Floats				
Pumps				
Lid				
Locks				
Wet Well				
Check Valves				
Electric Panel				
Operation				
Pump Lines				

Tuesday _____

	OK	NOT OK	NOTES	INITIALS
Floats				
Pumps				
Lid				
Locks				
Wet Well				
Check Valves				
Electric Panel				
Operation				
Pump Lines				

Wednesday _____

	OK	NOT OK	NOTES	INITIALS
Floats				
Pumps				
Lid				
Locks				
Wet Well				
Check Valves				
Electric Panel				
Operation				
Pump Lines				

Thursday _____

	OK	NOT OK	NOTES	INITIALS
Floats				
Pumps				
Lid				
Locks				
Wet Well				
Check Valves				
Electric Panel				
Operation				
Pump Lines				

Friday _____

	OK	NOT OK	NOTES	INITIALS
Floats				
Pumps				
Lid				
Locks				
Wet Well				
Check Valves				
Electric Panel				
Operation				
Pump Lines				

Monthly ByPass / Overflow Report

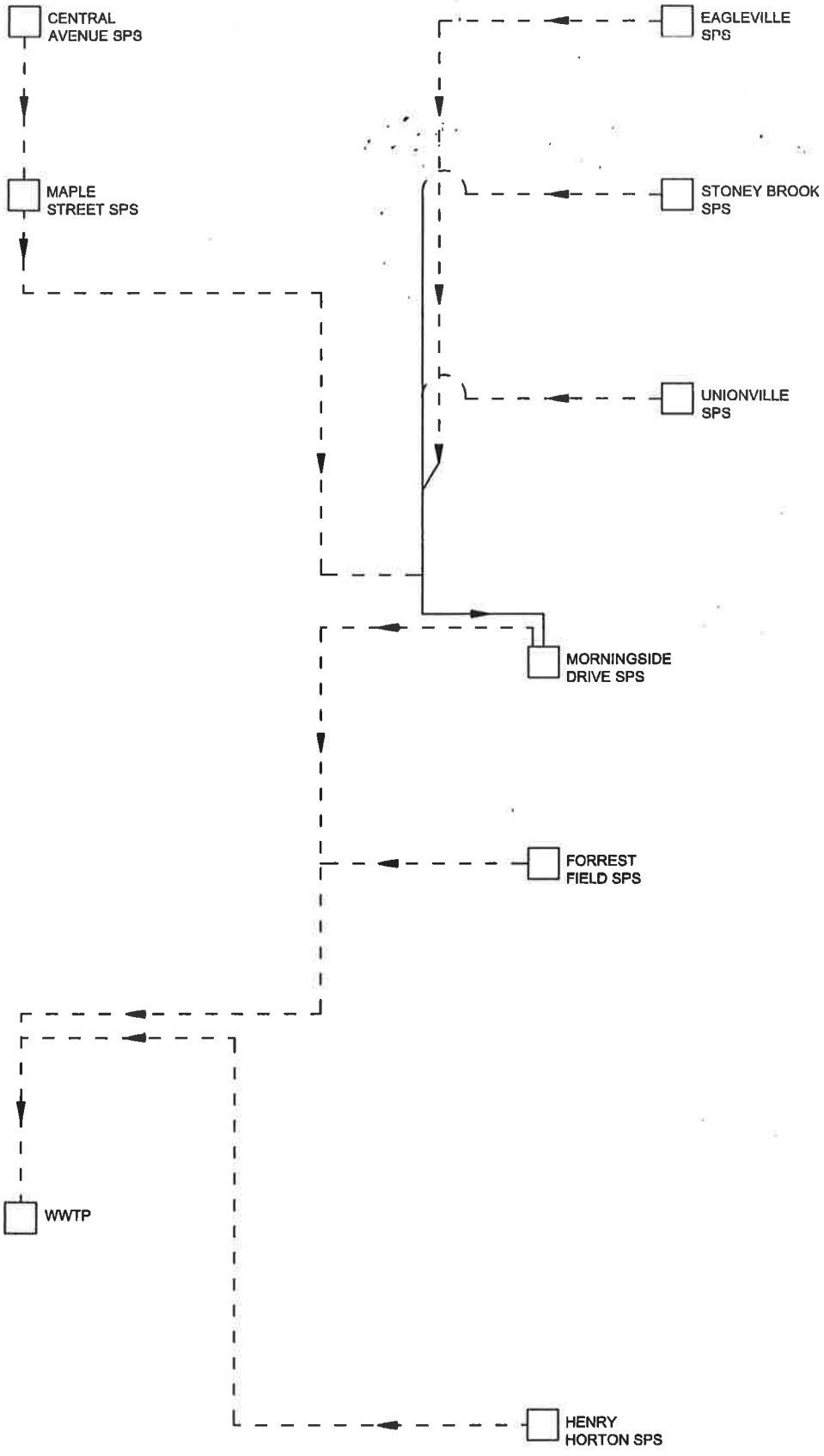
Facility: _____ County: _____

Month: _____ Year: _____ Permit Number: _____

System Contact: _____ Title: _____ Phone Number: _____

Date	Rain-Fall	Location of Bypass / Overflow & Nearest Stream	Duration / Time		Number of Gallons	Reason for Bypass / Overflow & Remedial Action
			From	To		

Exhibit 1



CHAPEL HILL, TENNESSEE
COLLECTION SYSTEM